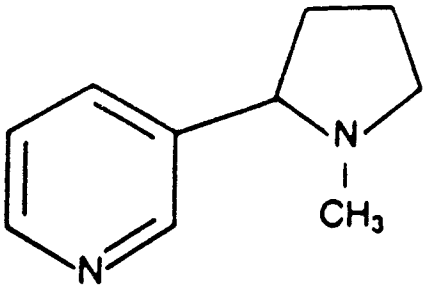
FINAL PROGRAM

International Symposium on Nicotine

The Effects of Nicotine on Biological Systems II

July 21-24, 1994
Hotel Le Chantecler
Montreal, Canada



Satellite Symposium of the XIIth International Congress of Pharmacology

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F.X. Adlkofer, Germany
K. Thurau, Germany

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Scientific Program

All symposium presentations and poster sessions will be held in **Seigneurie rooms I and II**. The Conference Secretariat office will be open during the entire meeting. It is situated on the main floor in room **Courmayeur.**

Thursday, July 21 - PM

14:00 - 19:00 **REGISTRATION**

19:00 - 20:00 **SESSION 1: Overview**
Chairperson: K. Thurau, Germany
(15 min presentation plus 5 min discussion)

19:00 **S1** - Current controversies in nicotine research
P.B.S. Clarke, Canada

19:20 **S2** - Acute biological effects of nicotine and its metabolites
N.L. Benowitz, USA

19:40 **S3** - Involvement of nicotine and its metabolites in the pathology of smoking and smoking-related diseases: Facts and hypotheses
F. X. Adlkofer, Germany

20:00 **BARBECUE ON TERRACE**

Friday, July 22 - AM

08:30 - 12:00 **SESSION 2: Structure and function of nicotinic receptors**
Chairpersons: J. Patrick, USA and D. Bertrand, Switzerland
(20 min presentation plus 10 min discussion)

08:30 **S4** - Assembly of the alpha7 containing neuronal nicotinic acetylcholine receptor
J. Patrick, USA

09:00 **S5** - Biochemical characterization of neuronal nicotinic receptors
F. Clementi, Italy

09:30 **S6** - Neuronal nicotinic receptor structure and function
J.M. Lindstrom, USA

10:00 **BREAK/POSTERS (refreshments will be served)**

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Friday, July 22 - AM (cont'd)

10:30	**S7** - Determinants regulating neuronal nicotinic receptor function D. Bertrand, Switzerland
11:00	**S8** - Expression, function, and regulation of neuronal ACh receptors containing the α7 gene product D. Berg, USA
11:30	**S9** - Regulation of acetylcholine receptor genes expression during synaptogenesis in muscle and brain J.-P. Changeux, France
12:00	**LUNCH**

Friday, July 22 - PM

13:30 - 15:10	**SESSION 3: Nicotinic receptor regulation and tolerance** Chairpersons: M.J. Marks, USA and K.J. Kellar, USA **(15 min presentation plus 5 min discussion)**
13:30	**S11** - The role of desensitization in CNS nicotinic receptor function P.M. Lippiello, USA
13:50	**S10** - Biochemical measures of nicotinic receptor desensitization M.J. Marks, USA
14:10	**S12** - Presynaptic heteroreceptors, autoreceptors and nicotinic receptor subtypes S. Wonnacott, UK
14:30	**S13** - Regulation of neuronal nicotinic receptors: *In vivo* and *in vitro* studies K.J. Kellar, USA
14:50	**S14** - Conditioned tolerance to nicotine in rats A.R. Caggiula, USA
15:10 - 18:00	**BREAK/POSTERS**

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Friday, July 22 - PM (cont'd)

19:00 - 22:00 **POSTER SESSION (wine, cheese, and more...)**

There will be five awards ($1,000 each) for the best poster presentations at the meeting. All meeting participants will be invited to submit their selection of the three best posters.

Saturday, July 23 - AM

08:30 - 12:00 **SESSION 4: Neuronal, trophic and endocrine effects of nicotine**

Chairpersons: M.J. Rand, Australia and K. Fuxe, Sweden

(15 min presentation plus 5 min discussion)

08:30 **S15** - Developmental effects of nicotine
T.A. Slotkin, USA

08:50 **S16** - Potentiation of transmission via presynaptic nicotine-activated channels permeable to calcium and blocked by α-BgTx
L.W. Role, USA

09:10 **S17** - Electrophysiology of nicotinic receptors in rodent CNS
C. Mulle, France

09:30 **S18** - Factors controlling nicotinic acetylcholine receptor expression on rat sympathetic neurons
E. Cooper, Canada

09:50 **BREAK/POSTERS (refreshments will be served)**
Deadline for submission of poster award voting slips

10:20 **S19** - A role for the nicotinic α-bungarotoxin receptor in growth related processes
M. Quik, Canada

10:40 **S20** - Mechanisms of nicotine stimulated cell proliferation in normal and neoplastic neuroendocrine lung cells
H.M. Schuller, USA

11:00 **S21** - Brainstem catecholaminergic pathways activated by nicotine are involved in the hippocampal expression of c-FOS mRNA and protein, stimulation of the hypothalamic paraventricular nucleus and secretion of ACTH
B.M. Sharp, USA

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Saturday, July 23 - AM (cont'd)

11:20	**S22** - Nicotine-induced gene expression of proenkephalin in bovine chromaffin cells V. Höllt, Germany
11:40	**S23** - Effects of nicotine on thromboxane and leukotriene synthesis in cellular systems M. Goerig, Germany
12:00	**LUNCH**

Saturday, July 23 - PM

13:30 - 18:00	**SESSION 5: Nicotine and smoking: Current controversies** Chairpersons: K. Bättig, Switzerland and A.C. Collins, USA **(10 min presentation plus 5 min discussion)**
13:30	**S24** - Smoking-induced alterations in brain electrical activity: Normalization or enhancement? V.J. Knott, Canada
13:45	**S25** - Nicotine and cognitive effects I. Hindmarch, UK
14:00	**S27** - Self-administered nicotine acts through the ventral tegmental area: Implications for drug reinforcement mechanisms W.A. Corrigall, Canada
14:15	**S28** - Desensitization of the stimulatory effects of nicotine on dopamine secretion in the mesolimbic system of the rat D.J.K. Balfour, UK
14:30	**S29** - Mechanisms of acute and chronic tolerance to the behavioral effects of nicotine J.A. Rosecrans, USA
14:45	**S30** - Behavioral and biochemical analysis of dependence properties of nicotine T. Yanagita, Japan
15:00	**BREAK/POSTERS (refreshments will be served)**

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Saturday, July 23 - PM (cont'd)

15:30	**S31** - Nicotine intake is regulated in humans M.A.H. Russell, UK
15:45	**S32** - There is more to smoking than the CNS effects of nicotine J. Rose, USA
16:00	**S33** - Pharmacological determinants of cigarette smoking J.E. Henningfield, USA
16:15	**S34** - Psychological resources from nicotine D.M. Warburton, UK
16:30	**S26** - Evidence that nicotine is addictive I.P. Stolerman, UK
16:45	**S35** - Nicotine is addictive R. West, UK
17:00	**S36** - Science and common-sense support the view that nicotine is not addictive J.H. Robinson, USA
17:15	**S37** - Individual differences in tobacco use may be related to genetically-determined differences in responses to nicotine A.C. Collins, USA
17:30	General Discussion - Is there a resolution?
19:30	**BANQUET (a night to remember!)** Announcement of poster award winners

Sunday, July 24 - AM

08:30 - 12:30	**SESSION 6: Nicotine and human diseases** Chairpersons: K. Kochsiek, Germany and R. Quirion, Canada **(15 min presentation plus 5 min discussion)**
08:30	**S38** - Relationship between smoking, nicotine and ulcerative colitis G. Thomas, UK

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Sunday, July 24 - AM (cont'd)

08:50	**S39** - Beneficial effects of nicotine in Tourette's syndrome P.R. Sanberg, USA
09:10	**S40** - Nicotine and neuropsychiatric disorders J.R. Hughes, USA
09:30	**S41** - Nicotine, auditory gating, and schizophrenia R. Freedman, USA
09:50	**S42** - Epidemiology of smoking and Parkinson's disease J.A. Baron, USA
10:10	**S43** - Nicotine and animal models of Parkinson's disease A.M. Janson, Sweden
10:30	**BREAK (refreshments will be served; posters should be removed at this time)**
11:00	**S44** - Memory enhancing effects of nicotine E.D. Levin, USA
11:20	**S45** - Possible mechanisms underlying beneficial effects of nicotine on cognitive function M.H. Joseph, UK
11:40	**S46** - Nicotinic modulation of cognitive functioning in humans P.A. Newhouse, USA
12:00	**CLOSING REMARKS** M.J. Rand, Australia
12:30	**CLOSING LUNCHEON**

N.B. Please check bulletin board in Conference Secretariat for departure times to airports and downtown Montreal.

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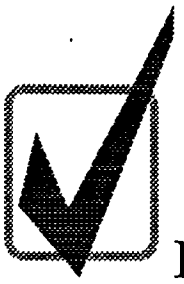
INSTRUCTIONS FOR SYMPOSIUM SPEAKERS

Speakers are requested to submit their slides to the projectionist in the conference room (Seigneurie I) **30 minutes** prior to the start of their session. Slide trays will be available in the conference room, where slides may be pre-screened if desired.

INSTRUCTIONS FOR POSTER PRESENTERS

The poster sessions will be held in Seigneurie I and II. Poster boards are numbered 1 - 137. The posters can be mounted after 3:00 p.m. on Thursday July 21 on the poster boards whose number corresponds to that of your poster abstract(s). Please refer to the first author index at the end of the Abstract Book for the appropriate poster abstract number. The posters will be on display for the duration of the meeting. Author attendance is requested during the BREAK/POSTER periods and at the poster wine and cheese evening.

Please note that the posters should be removed by 11:00 a.m. Sunday, July 24.



POSTER AWARD VOTING SLIP

The Verum Foundation for Behaviour and Environment will award five prizes of $1,000 Can each to the first authors of the best posters presented at the International Symposium on Nicotine in Ste Adèle. The winners will be selected by the conference participants. The scientific importance of the results and their visual presentation are to be appraised at a ratio of 2:1. The point system ranges from 1 (low) to 10 (high). Sum total = points for 'scientific relevance' x 2 + points for 'visual presentation'. Each participant may select three posters.

Voters are requested to fill out the voting slip and return it to the Conference Secretariat.
Deadline: Saturday, July 23 at 10:30 a.m.

		POINTS	TOTAL (out of 30)
POSTER NO. _____			
Scientific importance	**2 x**	_____	
			= _____
Visual presentation	+	_____	
POSTER NO. _____			
Scientific importance	**2 x**	_____	
			= _____
Visual presentation	+	_____	
POSTER NO. _____			
Scientific importance	**2 x**	_____	
			= _____
Visual presentation	+	_____	

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SYMPOSIUM ABSTRACTS

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S3 Involvement of Nicotine and its Metabolites in the Pathology of Smoking and Smoking-Related Diseases: Facts and Hypotheses, F.X. Adlkofer

SESSION 2: STRUCTURE AND FUNCTION OF NICOTINIC RECEPTORS

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S5 Biochemical Characterization of Neuronal Nicotinic Receptors, C. Gotti and F. Clementi

S6 Neuronal Nicotinic Receptor Structure and Function, J.M. Lindstrom

S7 Determinants Regulating Neuronal Nicotinic Receptor Function, D. Bertrand, S. Bertrand, I. Forster and J.-P. Changeux

S8 Expression, Function, and Regulation of Neuronal ACh Receptors Containing the $\alpha 7$ Gene Product, D. Berg, W. Conroy, R. Corriveau, P. Pugh, M. Rathouz, S. Romano, S. Vijayaraghavan and Z.-W. Zhang

S9 Regulation of Acetylcholine Receptor Genes Expression during Synaptogenesis in Muscle and Brain, J.-P. Changeux, J.L. Bessereau, A. Bessis, A. Duclert, C. Le Poupon, H.O. Nghiêm, A.M. Salmon and N. Savatier

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S11 The Role of Desensitization in CNS Nicotinic Receptor Function, P.M. Lippiello, M. Bencherif and R.J. Prince

S12 Presynaptic Heteroreceptors, Autoreceptors and Nicotinic Receptor Subtypes, S. Wonnacott

S13 Regulation of Neuronal Nicotinic Receptors: *In Vivo* and *In Vitro* Studies, K.J. Kellar, M.I. Davila-Garcia, Y. Xiao, R.A. Houghtling, R.D. Mellon, S.S. Qasba and C.M. Flores

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S16 Potentiation of Transmission via Presynaptic Nicotine-Activated Channels Permeable to Calcium and Blocked by α-BgTx, L.W. Role

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S19 A Role for the Nicotinic α-Bungarotoxin Receptor in Growth Related Processes, M. Quik

S20 Mechanisms of Nicotine Stimulated Cell Proliferation in Normal and Neoplastic Neuroendocrine Lung Cells, H.M. Schuller

S21 Brainstem Catecholaminergic Pathways Activated by Nicotine are Involved in the Hippocampal Expression of c-Fos mRNA and Protein, Stimulation of the Hypothalamic Paraventricular Nucleus and Secretion of ACTH, B. Sharp

S22 Nicotine-Induced Gene Expression of Proenkephalin in Bovine Chromaffin Cells, V. Höllt, X. Wang and B. Bacher

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S26 Evidence that Nicotine is Addictive, I.P. Stolerman and M.J. Jarvis

S27 Self-Administered Nicotine Acts Through the Ventral Tegmental Area: Implications for Drug Reinforcement Mechanisms, W.A. Corrigall

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S32 There is More to Smoking than the CNS Effects of Nicotine, J. Rose

S33 Pharmacological Determinants of Cigarette Smoking, J.E. Henningfield

S34 Psychological Resources from Nicotine, D.M. Warburton

S35 Nicotine is Addictive, R. West

S36 Science and Common-Sense Support the View that Nicotine is not Addictive, J.H. Robinson and W.S. Pritchard

S37 Individual Differences in Tobacco Use May be Related to Genetically-Determined Differences in Responses to Nicotine, A.C. Collins, S.F. Robinson and M. Marks

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S39 Beneficial Effects of Nicotine in Tourette's Syndrome, P.R. Sanberg and A.A. Silver

S40 Nicotine and Neuropsychiatric Disorders, J. Hughes

S41 Nicotine, Auditory Gating, and Schizophrenia, R. Freedman, L.E. Adler, P. Bickford, V. Luntz-Leybman, K. Wear, L.J. Hoffer, J. Griffith, M. Waldo, H. Coon, M. Myles-Worsley, S. Leonard and W. Byerley

S42 Epidemiology of Smoking and Parkinson's Disease, J.A. Baron

S43 Nicotine and Animal Models of Parkinson's Disease, A.M. Janson, A. Møller, P.B. Hedlund, G. von Euler and K. Fuxe

S44 Memory Enhancing Effects of Nicotine, E.D. Levin and D. Torry

S45 Possible Mechanisms Underlying Beneficial Effects of Nicotine on Cognitive Function, M.H. Joseph, G. Grigoryan, H. Hodges and J.A. Gray

S46 Nicotinic Modulation of Cognitive Functioning in Humans, P.A. Newhouse, A. Potter, M. Piasecki, J. Geelmuyden, J. Corwin and R. Lenox

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P2 Effects of Denervation Upon Nicotinic Acetylcholine Receptor Clusters in Autonomic Neurons as Determined by Quantitative Laser Scanning Confocal Microscopy, P.B. Sargent and H.L. Wilson

P3 Cellular Diversity in the Expression of Nicotinic Acetylcholine Receptor Subunits in the Chick Central Nervous System, E.M. Ullian and P.B. Sargent

P4 Cellular and Subcellular Visualization of the β2 - Subunit of the Nicotinic Acetylcholine Receptor in the Mouse Cerebral Cortex, R. Marks, J. Lindstrom and H. Schröder

P5 Immunocharacterization of the Human Alpha 7 Neuronal Nicotinic Acetylcholine Receptor Subunit, M. Piattoni-Kaplan, D. Donnelly-Roberts, J. Pauly, D. Hill, J.B. Pan, S.P. Arneric and J.P. Sullivan

P6 Localization of [^{3}H] Cytisine Nicotinic Binding Sites in Normal and Pathological Human Brain Using *In Vitro* Receptor Autoradiography, I. Aubert, D. Cécyre, S. Gauthier and R. Quirion

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POSTER ABSTRACT ADDENDUM

P68a

MEASURING INCREASES IN MESOLIMBIC DOPAMINE AND RELATED SUBSTANCES IN RESPONSE TO SYSTEMIC NICOTINE USING IN VIVO ELECTROCHEMISTRY. G.C. Parker and P.B.S. Clarke Dept. of Pharmacology, McGill University, Montreal, Canada H3G 1Y6.

Many of the psychopharmacological properties of tobacco smoking are believed to be mediated by central nicotinic receptors (nAChRs). The locomotor stimulant and reinforcing effects of nicotine in rats are blocked by a selective loss of mesolimbic dopamine innervating the ventral striatum. Using selective and non-selective electrochemical probes, we have monitored the release of DA alone and also the levels of DOPAC and ascorbate, in the nucleus accumbens following systemic administration of nicotine (0.4 mg/kg s.c.) in unanaesthetized freely-moving rats. The increase in current observed at the dopamine-selective probe was seen to be maximal within 20 min and returned to baseline after 60 min. In contrast, the increase in signal at the non-selective probe was maximal at 2 hr and returned to baseline after 5 hr. The superior frequency of sampling afforded by in vivo electrochemistry has clear advantages. In particular, it should enable us to characterize rapid neurochemical changes in response to nicotine when the drug is given in ways that more closely mimic the pharmacokinetics of smoking.

P91

CHRONIC NICOTINE-INDUCED COGNITIVE FACILITATION ARE CORRELATED WITH CHANGES IN THE NICOTINE BINDING SITES. F.A. Abdulla, E.J. Bradbury, M.-R. Calaminici, S. Wonnacott, J.D. Stephenson, J.D. Sinden and J.A. Gray. Dept. of Pharmacology, University of Alberta, Canada, Depts. of Neuroscience and Psychology, Institute of Psychiatry, London, and Dept. of Biochemistry, University of Bath, Bath, U.K.

The present study investigated the role of nicotinic receptors in chronic nicotine-induced cognitive facilitation. (-)-Nicotine tartrate (2mg/kg) and mecamylamine (1.0 mg/kg) were administered to different groups of rats twice daily for 10 days. A third group received the same dose of nicotine for one day and the vehicle (saline) for 9 days. Beginning 24h after the final drug injection, the rats were compared to a vehicle control group on acquisition of a hidden platform in the Morris water maze over 20 trials with 30-min inter-trial interval. The rats were killed 48h after the last drug injection and their frontal cortex (FC), entorhinal cortex (EC), posterior cingulate cortex (PC), dorsal hippocampus (DH) and ventral hippocampus (VH) were rapidly dissected to be assayed for nicotinic binding sites. Chronic treatment with nicotine significantly increased the number of FC, EC and DH but not the PC or the VH binding sites and improved the rate of learning. Chronic treatment with mecamylamine significantly increased the number of FC but not the other regions nicotinic receptors and decreased the rate of learning. Nicotine given for one day increased the EC (but not other regions) binding sites and increased the rate of learning but failed to match the rats receiving nicotine for 10 days. There were significant correlations between the EC, DH and PC (but not FC or VH) nicotinic receptor numbers and the rate of learning during acquisition but not with performance at asymptote. The results may indicate that chronic nicotine increased cholinergic transmission which in turn induced learning facilitation. Supported by R.J. Reynolds Tobacco Co.

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